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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,597	10/29/2003	Michael S. Lockard	P-US082-A-MF	7857

32107 7590 02/28/2007
MICROFABRICA INC.
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EXAMINER

BAREFORD, KATHERINE A

ART UNIT	PAPER NUMBER
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1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/697,597

Applicant(s)

LOCKARD ET AL.

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 6-22 and 24-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 23, 27 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Species 1 (directed to depositing the second material by thermal spraying), reading on claims 1-5, 23, 27 and 28 in the reply filed on January 16, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

As discussed in paragraph 3 of the Restriction Requirement of December 14, 2006, species 1-10 enumerated in the election of species requirement mailed August 23, 2006 are actually sub-species of Species 1 directed to thermal spraying, and thus, should applicant elect Species 1 directed to thermal spraying, applicant will also be considered to have elected sub-species 8 (elected in the response of September 21, 2006), where the thermal spraying method is a high velocity particle consolidation spraying process (HVPC).

Moreover, the Examiner also notes that ^{election of} Species A, the first embodiment of the invention was made in the reply filed on June 12, 2006 (in Remarks of February 24, 2006).

2. As a result: claims 1-5, 23, 27 and 28 have been examined as reading on the claimed species, and claims 6-22 and 24-26 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there

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being no allowable generic or linking claim. Election was made **without** traverse in the replies filed on January 16, 2007, December 14, 2006 and June 12, 2006 (in Remarks of February 24, 2006).

Drawings

3. The drawings were received on February 24, 2006 (with replacement annotated sheets June 12, 2006). These drawings are approved.

Specification

4. The substitute specification filed February 24, 2006 is approved.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 4, 5, 23, 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagashima et al (US 4412377).

Claims 1, 27: Nagashima teaches a process for forming a multilayer three-dimensional structure. See figure 7 and column 6, lines 15-35. A first layer is formed on

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VB a substrate. Figure 5B and column 4, lines 25-35. Then a layer comprising a plurality of material is adhered to the first, previously formed layer on the substrate. See figure 5D and column 4, lines 30-50 (layer of sections of resist 23 and sections of copper 24 is formed). The forming and adhering is repeated at least once to build up a three-dimensional structure from a plurality of adhered layers. Figure 7 and column 6, lines 25-60 (note layer with ceramic 31 and resist, and then layer with ceramic 31 and copper 32, for example). The forming of at least one of the plurality of adhered layers comprises (1) obtaining a selective pattern of deposition of a first material having at least one void by selectively depositing a first material onto a previously formed layer such that at least one void remains. Figure 5C and column 4, lines 30-40 (application of patterned layer of resist 23, which leaves voids). Then (2) a second material is deposited into the at least one void via a thermal spraying process. Figure 5D and column 4, lines 35-50 (application of copper layer 24 by flame spraying).

Claim 2: at least one planarization operation can be performed during the forming of a layer. Column 4, lines 50-66 (epoxy resin impregnated into the layers is wiped and sanded off, see discussion of claim 4 below).

Claim 4: during the formation of at least one layer, a porous deposit of the second material is applied, and a third material is thereafter infiltrated into at least a portion of the pores of the second material. Figure 5F and column 4, lines 50-65 (layer 24 is porous as it is impregnated with the applied epoxy resin).

Claim 5: after the depositing via a thermal spraying process, during the forming of at least one layer, a subsequent operation is performed that modifies the second material. Figure 5F and column 4, lines 50-65 (layer 24 is impregnated with the applied epoxy resin).

Claims 23, 28: the forming of the plurality of adhered layers comprises forming at least two layers of the plurality of adhered layers. Figure 7 and column 6, lines 25-65 (note the repeated application of layers with thermal spraying sections and resist sections).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagashima as applied to claims 1, 2, 4, 5, 23, 27 and 28 above, and further in view of Amateau, et al "High-Velocity Particle Consolidation Technology", iMAST Quarterly 2000, No. 2, pages 3-6 (hereinafter Amateau Article).

Nagashima teaches all the features of these claims except that the thermal spraying method is a high velocity particle consolidation (HVPC) spraying process.

However, Amateau Article teaches that HVPC is a known thermal spray application method that offers improvements over other conventional thermal spraying methods such as plasma or flame spraying, with HVPC offering lower deposition temperatures eliminating problems associated with recrystallization in both coating and substrates, as well as other benefits. Pages 3-4. The coatings can be applied in patterns with masking. Page 4.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nagashima to use HVPC as the thermal spraying method to apply the copper and ceramic layers as suggested by Amateau Article with an expectation of providing a desirably improved coating, because Nagashima teaches application using conventional thermal spray methods of plasma and flame spraying and Amateau Article teaches that the thermal spray method of HVPC offers improved

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benefits over conventional thermal spray methods such as flame or plasma spraying, including offering lower deposition temperatures eliminating problems associated with recrystallization in both coating and substrates.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KATHERINE BAREFORD
PRIMARY EXAMINER